Figures 2(a) and 2(b) illustrate variations on Figure2. In particular, Figures 2(a) and 2(b) both show the mesh grid 23 within a liner 20 attached to an electron gun assembly 1. In Figure 2(b), the liner 20 is attached to the electron gun assembly 1 via a liner flange 21 and an electron gun flange 16. In Figure 2(a), the liner 20 is attached to the electron gun assembly 1 at weld 22. The liner 20 and electron gun assembly 1 could be attached by other techniques known to one of ordinary skill in the art, as long as the attachment is vacuum tight. Alternatively, the mesh grid 23 could be placed below the boundary between the liner flange 21 and the electron gun flange 16 or below the weld 22, within the electron gun assembly 1, as long as the mesh grid 23 remains within the drift space 19.

IN THE CLAIMS

Please amend the following claims.

1. (Amended) A charged particle illumination system component, comprising:

a lens array configured to be placed in said charged particle illumination system component,

wherein said lens array is configured to increase emittance of an electron beam which passes through said lens array.

R3

4. (Amended) A charged particle illumination system component, comprising:

a lens array configured to be placed in said charged particle illumination system component,

wherein said illumination system component is a liner tube, connectable to an electron gun.

R4

18. (Amended) The method of claim 17, wherein the liner tube and the electron gun are secured vacuum-tight.

R5

25. (Amended) An electron beam exposure tool comprising:

a charged particle illumination system component including a lens array placed in said charged particle illumination system component,

wherein said lens array is configured to increase emittance of an electron beam passing through said lens array.

R6

29. (Amended) An electron beam exposure tool comprising:

a charged particle illumination system component including a lens array placed in said charged particle illumination system component,

wherein said illumination system component is a liner tube connectable to an electron gun.

Please add the following claims.

--30. The apparatus of claim 1, wherein said illumination component is a liner tube, connectable to an electron gun.

31. The apparatus of claim 1, wherein said lens array increases emittance of an electron beam by producing a divergent beam from an incoming electron beam

32. The apparatus of claim 8, wherein the emittance of the electron beam is increased by a factor substantially equal to $(L/d)^2$,

where L represents a pitch of said mesh grid,

and d represents a diameter of an beam crossover created by each small opening in said mesh grid.

33. The apparatus of claim 10, wherein said lens array includes an odd number of mesh grids, including two outer mesh grids having a curved shape,

and wherein spherical aberration of an electron beam passing through said lens array is reduced.

34. The method of claim 14, further comprising the step of:

directing an electron beam through said lens array to increase emittance of said electron beam.

35. An electron gun including a liner tube comprising:

an electron emitter for emitting an electron beam;

at least one mesh grid disposed in said liner tube at a drift space of said electron gun to receive and control emittance of said electron beam.

36. The electron gun of claim 35, wherein the electron gun is secured vacuum-tight.

37. The electron gun of claim 35, wherein said at least one mesh grid increases the emittance of said electron beam.

38. The electron gun of claim 37, wherein the emittance of the electron beam is increased by a factor substantially equal to $(L/d)^2$,

where L represents a pitch of said mesh grid,

and d represents a diameter of an beam crossover created by each small opening in said mesh grid.

39. The electron gun of claim 35, wherein said at least one mesh grid includes an odd number of mesh grids greater than or equal to three, including two outer mesh grids having a curved shape,